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An Introduction to the Study of Zoölogy. By B. LINDSAY, C. S. of Girton College, Cambridge. The Macmillan Company, New York. \$1.60.

THIS is a small octavo volume of 356 pages, illustrated with 124 figures and diagrams, eighteen of which are original. The purpose of the author is to supply "a simple outline sketch of the animal kingdom, so as to enable the reader to map in, as it were, his own particular field of study in its right place in the general scheme of zoölogical knowledge. It is also intended to guide the reader to the use of standard works."

The work is divided into three parts—pages 3 to 116 being devoted to the general principles of zoölogy, pages 117 to 308 consider systematic zoölogy, and the remaining pages, about 25, give advice to students as to the use of books, practical works, and "animals as fellow-creatures."

This is not a laboratory manual, but a book to be read or studied and recited from. Its aim is certainly good, for it strives to give the reader a general survey of the morphology and classification of the animal kingdom. One who is devoted to the laboratory method, where only a few forms can be studied, must feel occasionally in talking with his students that they are getting, not a bird's-eye view of the living world, but a microscopic view of a very little of it. Certainly it is a view which does not well fit one for a general examination, and "the lively recollections" of the author of her own trials in preparing for such a general examination seems to have been one of the incentives for "compiling the book" (preface).

The work is prepared in an admirable spirit, and one cannot read its pages without having a more comprehensive view of the animal world; and, if the student catches the sympathetic spirit of the author in the chapter on "animals as fellow-creatures," it will make his zoölogical paths far pleasanter and more profitable. It is with some regret that the reviewer feels compelled to say in closing that he believes the author would have done well to have waited a few years before publishing the book. If in the meantime some original work had been carried on and the books and monographs of others had been dipped into rather deeply, the author would hardly affirm with so much confidence (page 59) that "the ontogenetic development of any form of life is an expression of its phylogenetic development. This formula

serves as a key to a labyrinth of facts, which are all plain and intelligible with its aid." If the author had studied the embryology of the chicken, for instance, and had used this key, and was able to tell the world exactly what the phylogenetic history or the evolution of the chick had been in the past, she would have done what no embryologist has yet been able to do, or even to approximate. So also on page 57, a little original work on worms, insects, and amphibia would have kept her from saying: "The larva of the butterfly, like the larva of the frog, presents the likeness of an adult animal of a lower type; the young frog is a fish, the young butterfly is a worm." S. H. GAGE

CORNELL UNIVERSITY

Elementary Algebra. By J. A. GILLET.

IT is far too common an impression among preparatory students that geometry is that branch of mathematics in which one proves theorems, while in algebra one simply ciphers with letters and solves problems by means of equations. How many students of algebra are accustomed to think of a statement like $A^m A^n = A^{m+n}$ as a theorem which should be enunciated in words with a distinct hypothesis and conclusion, and proved step by step, using definitions, axioms, and previously established laws or theorems? How many teachers insist upon the demonstration of the laws and principles of algebra? How many text-books present these proofs in such a way as to impress the student with the dignity of the science and the stability of its foundation on logic and reasoning? It is true that one great end of algebra is to use literal arithmetic in the application of equations to the solution of problems, but the text-book on algebra which does not present the subject in the form of the elements of true analysis, and the teacher who does not lead the pupil to see that here is the great instrument of analysis, the elements of which he can master only by demonstrating the various laws and principles enunciated, are robbing the rising generation of mental brawn and sinew and depriving the colleges and universities of students prepared to grapple with the analytic problem arising in the higher courses.

There are two extremes to avoid. It is possible to make elementary algebra too formal and too rigid in its proofs. It is possible to make it a mere collection of rules and examples. The author who most skillfully avoids both these extremes is to be commended. Within